

REMARKS

I. Status of Claims

Claims 1-84 are currently pending in this Application. Claims 1-31, 45, 46, 48-65, 72-77, and 79-80 have been withdrawn. Claims 32-44, 47, 66-71, and 78 stand rejected. Claims 81-84 have been added by this Amendment. Claims 1, 14, 32, and 84 are in independent format.

II. Interview Acknowledgement and Summary

Applicants would like to thank the Examiner and her supervisor, Mr. Sergeant, for meeting with Polly Owen, Brendan Boyd (telephonic), John Allen, and Kameron Kelly on November 6, 2007 to discuss the present Application. A summary of the meeting is provided in the Interview Summary sheet prepared by the Examiner on the day of the interview.

III. Election/Restrictions

In the Office Action mailed March 22, 2006, the Examiner restricted original claims 1-66 into the following five Groups:

- Group I: Claims 1-44 (Cellulose Ester)
- Group II: Claims 45-54, 58, and 60-66 (Coating Composition)
- Group III: Claims 55-56 (Pigment Dispersion)
- Group IV: Claim 57 (Radiation Curable Coating)
- Group V: Claim 59 (Ink Composition)

In addition, the Examiner indicated that the Application discloses the following four species groups:

- Group A: Claims 1-13; 14-31; or 32-44 (Various Compositions)
- Group B: Claims 45, 48, 49, and 64; 46, 50-54, 60-63, and 65;
or 47 and 66 (Various Compositions)
- Group C: Claims 49 and 51 (Additives)
- Group D: Claims 60-63 (Substrates)

In Applicants' response filed September 22, 2006, claims 67-80 were added. In the Office Action mailed May 16, 2007, the Examiner indicated that new claims 72-77

and 79-80 are drawn to non-elected inventions and species, there being no allowable generic or linking claims.

In the present Amendment, Applicants have added new independent claim 81. New claim 81 is generic to all the pending claims because all the claims expressly or by dependency include all the limitations of claim 81. Therefore, once generic claim 81 has been allowed, all withdrawn claims should be rejoined and allowed.

IV. Claim Rejections – 35 USC § 103

A. Summary of Examiner's Rejection

In the Office Action mailed May 16, 2007, the Examiner rejected claims 32-44, 47, 66-71, and 78 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,668,273 to Allen et al. (hereinafter, Allen).

In rejecting these claims, the Examiner admits that Allen fails to anticipate Applicants' claimed inherent viscosity (IV), molecular weight (M_n and M_w), and polydispersity ranges because the IV, M_n , M_w , and polydispersity ranges disclosed in Allen do not overlap the claimed ranges. However, the Examiner goes on to assert that because the lower IV limit disclosed by Allen (0.20 dL/g) is close to the upper IV limit recited in the claims (0.15 dL/g), one skilled in the art would have expected the composition of Allen to have the same properties as the claimed composition. Therefore, according to the Examiner, a *prima facie* case of obviousness exists under the rationale set forth in *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ, 773 (Fed. Cir. 1985) (hereinafter, *Titanium Metals*).

In rejecting Applicants' claims, the Examiner also asserts that although the M_n , M_w , and polydispersity ranges recited in Applicants' claims do not overlap the ranges disclosed in Allen, the Examiner claimed the M_n , M_w , and polydispersity ranges would be inherent in the disclosure of Allen because one skilled in the art would recognize that a reduction in IV indicates a reduction in molecular weight.

B. Applicants' Arguments Against Prima Facie Case of Obviousness

1. *Titanium Metals* Does Not Support Obviousness Conclusion

According to the ruling in *Titanium Metals*, a *prima facie* case of obviousness may exist where the claimed ranges and the prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Applicants submit that the rule of *Titanium Metal* can not be used to establish a *prima facie* case that Applicants' claims are obviousness over Allen because one skilled in the art would recognize that the composition disclosed in Allen and the claimed composition have significantly different properties.

In *Titanium Metals*, the claim at issue called for an alloy comprising 0.3% molybdenum (Mo) and 0.8% nickel (Ni). The prior art cited against the claim disclosed one alloy comprising 0.25% Mo and 0.75% Ni and another alloy comprising 0.31% Mo and 0.94% Ni. Table 1, provides a side-by-side comparison of the disclosed and claimed values at issue in *Titanium Metals*.

Table 1

<i>Titanium Metals</i> - Disclosed and Claimed Values			
	1 st Disclosed Alloy	Claimed Alloy	2 nd Disclosed Alloy
Molybdenum	0.25%	0.3%	0.31%
Nickel	0.75%	0.8%	0.94%

As clearly shown in Table 1, in *Titanium Metals*, the prior art disclosed values that straddled the claimed values. Further, the claimed values in *Titanium Metals* specified the amount of certain components in the composition, not actual properties of the composition.

In contrast to *Titanium Metals*, Applicants' claimed IV, M_n , M_w , and polydispersity values are actual properties of the composition – not simply components of the composition. Further, Applicants' claimed IV, M_n , M_w , and polydispersity values are significantly lower than all the values disclosed in Allen – not straddled by the values disclosed in Allen.

According to the Examiner, a 0.05 dL/g change in IV would not significantly change the properties of Applicants' or Allen's cellulose ester compositions. Applicants respectfully disagree. Applicants' claim 32 recites an IV range of 0.05 to 0.15 dL/g, while the lowest IV disclosed by Allen is 0.20 dL/g. When considering IVs in this range (i.e., 0.05–0.20 dL/g), a change of 0.5 dL/g is very significant. As summarized in Table 2, below, a 0.5 dL/g IV increase from 0.05 to 0.10 dl/g is a 100% change in IV, an increase from 0.10 to 0.15 dl/g is a 50% change in IV, and an increase from 0.15 to 0.20 dl/g is a 25% change in IV.

Table 2

0.05 dL/g Changes In IV	% Change In IV
0.05 → 0.10	100
0.10 → 0.15	50
0.15 → 0.20	25

Thus, in the range of IV values relevant to the instant Application (i.e., 0.05–0.20 dL/g) a 0.05 dl/g IV increase equates to a 25–100% change in IV.

Applicants submit that a 25-100% IV change is significant, and since IV is itself a key property of Applicants' and Allen's cellulose ester compositions, a 25-100% change in IV is, on its face, a significant property change. Therefore, *Titanium Metals*, which requires the prior art composition and the claimed composition to have the same properties, can not be used to reach a conclusion that Applicants' claims are obviousness over Allen.

In addition, other properties of cellulose esters change significantly when the IV of a cellulose ester is changed by 0.05 dL/g. For example, a 0.05 dl/g change in IV can significantly change the molecular weight (M_n and/or M_w) of a cellulose ester. The present Application includes a wealth of data evidencing that a 0.05 dL/g change in IV correlates to a substantial change in the M_n of a cellulose ester. In particular, Examples 1–27 of the present Application provide property data for 27 different cellulose esters having IVs ranging from 0.062 dL/g to 0.122 dL/g. These values are summarized in Table 2 on page 63 of the present Application.

Figures 1–4, below, plot the IV and M_n data from Examples 1-8, 9-13, 16-19, and 24-26 of the present Application and provide a linear fit for the data in each Figure. Examples 14, 15, 20, 21, 23 and 27 of the present Application were not plotted because IV or M_n was not tested for those samples. Example 22 was not plotted because it only provides one data point for that particular cellulose ester composition (HS-CAB 46).

Figure 1

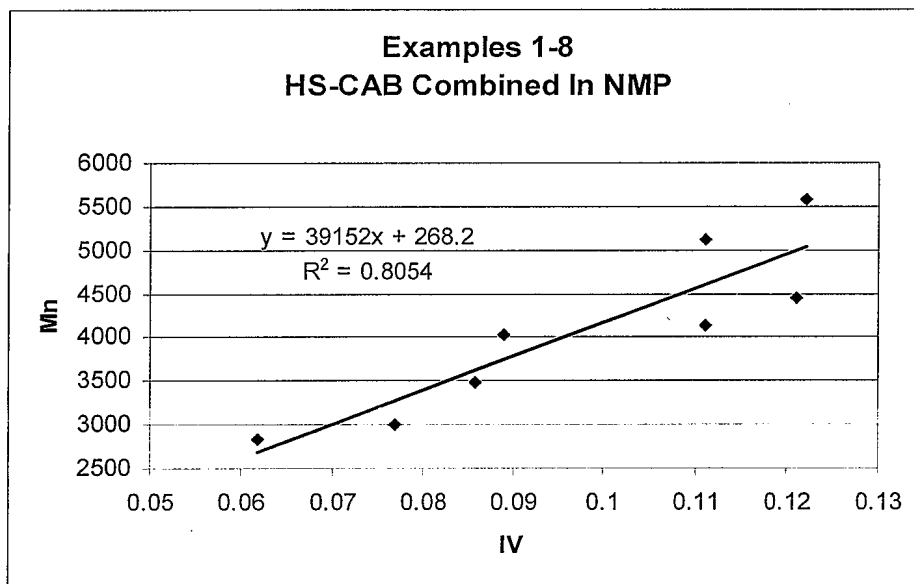


Figure 2

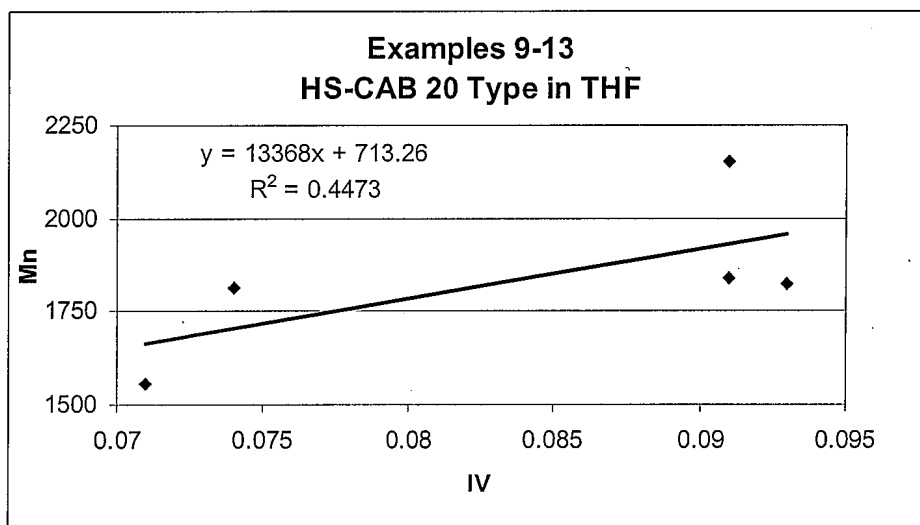


Figure 3

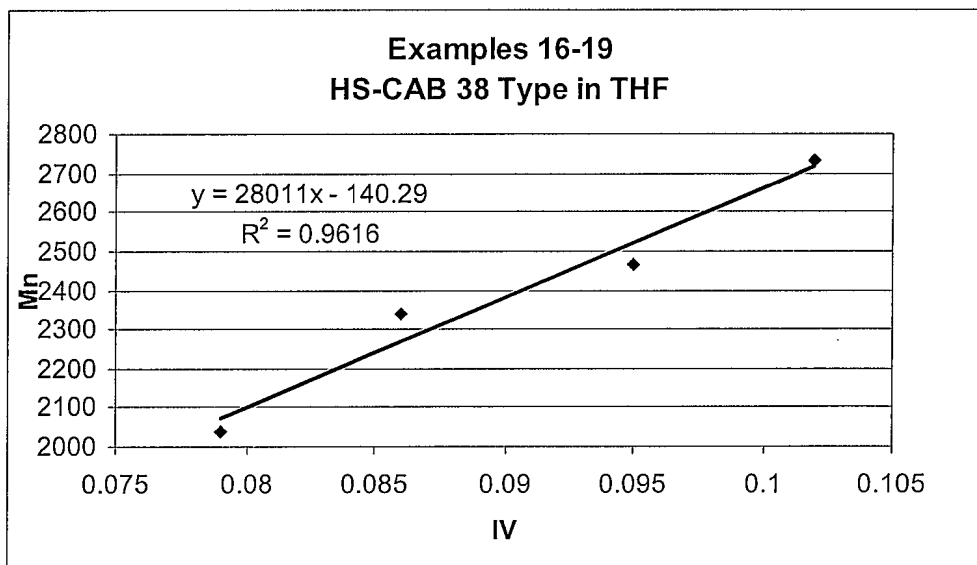


Figure 4

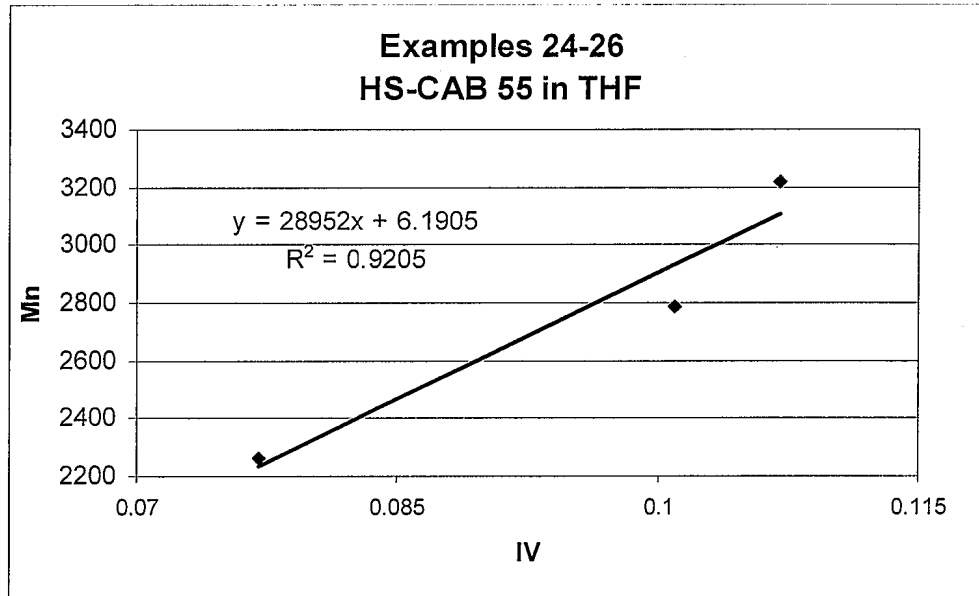


Table 3, below, takes the linear fit equations determined from the above plots of the data from Table 2 of the present Application and uses them to calculate the percent change in M_n as IV is increased by 0.05 dL/g increments from 0.05 dL/g to 0.20 dL/g.

Table 3

Calculational Data Based On Linear Fit Of Data From Table 2 Of Application						
0.05 dL/g IV Changes	% Change in IV	Combined in NMP % Change In M_n	HS-CAB 20 in THF % Change In M_n	HS-CAB 38 in THF % Change In M_n	HS-CAB 55 in THF % Change In M_n	Overall Average % Change In M_n
0.05 → 0.10	100	88	48	111	100	87
0.10 → 0.15	50	47	33	53	50	45
0.15 → 0.20	25	32	25	34	33	31

The data presented in Table 3 clearly demonstrates that a 0.05 dL/g change in the IV of a cellulose ester not only has a significant impact on IV itself, but also significantly changes the M_n of the cellulose ester. In fact, when averaging all the available data from Table 2 of the present Application, a 31% change in M_n is the minimum change associated with a 0.05 dL/g change in IV (within the 0.05–0.20 dL/g range of interest). Applicants submit that M_n is a key property of cellulose ester compositions, and a 31% change in M_n is a significant change in a property of a cellulose ester composition. Therefore, *Titanium Metals*, which requires the prior art composition and the claimed composition to have the same properties, can not be used to reach a conclusion that Applicants' claims are obviousness over Allen.

In view of the foregoing, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claims 32-44, 47, 66-71, and 78.

2. No Reason To Modify Allen To Arrive At Claimed Properties

As demonstrated above, *Titanium Metals* can not be relied upon to establish a *prima facie* case of obviousness for claims 32-44, 47, 66-71, and 78. Therefore, since the claimed ranges of IV, M_w , M_n , and polydispersity do not overlap the disclosed

ranges of Allen, in order to establish a *prima facie* case of obviousness, the Examiner has the burden of articulating a reason why one skilled in the art would have modified the composition to Allen by lowering its IV, M_w , M_n , and polydispersity into the ranges now claimed by Applicants. Table 4, below, provides a side-by-side comparison of Applicants' claimed IV, M_w , M_n , and polydispersity ranges and the corresponding ranges disclosed by Allen.

Table 4

Comparison Of Claimed and Disclosed Ranges		
Property of the Cellulose Ester	Range Recited In Claim	Range Disclosed In Allen
IV	0.05 – 0.15	0.2 – 0.70
M_n	1,000 – 5,600	9,000 – 40,000
M_w	1,500 – 10,000	30,000 – 100,000
Polydispersity	1.2 – 3.5	4 – 20

Applicants submit that at the time of the present invention, one skilled in the art had no reason to modify the composition of Allen by lowering its IV, M_w , M_n , and polydispersity values into Applicants' claimed ranges because, for example, Allen teaches away from such a modification. In particular, Allen teaches that an increase in viscosity is beneficial in waterborne coatings, and provides superior compatibility. (Col. 2, lines 53-62). Further, Allen teaches that a rapid viscosity build is useful for reducing runs and sags in waterborne spray applications. (Col. 6, lines 24-26). Finally, Allen teaches that an increase in viscosity helps prevent sagging of the coating. (Col. 16, lines 18-21).

Allen only discusses the benefits of increased viscosity, which would motivate one to increase IV, M_w , and M_n of the cellulose ester. Allen never suggests that lowering IV, M_w , M_n , and/or polydispersity would provide any benefits. Rather, when taken as a whole, the teachings of Allen would actually discourage one skilled in the art from attempting to lower the IV, M_w , and M_n of the cellulose esters described therein. Therefore, because, for example, there was no reason to modify the composition of Allen by lowering its IV, M_w , and M_n towards Applicants' claimed values, claims 32-44, 47, 66-71, and 78 are not obviousness over Allen.

3. Other Properties Not Inherent By Simply Lowering The IV

In the Office Action, the Examiner asserts that by lowering the IV of Allen's cellulose ester, one would inherently produce a composition having M_w , M_n , and polydispersity values within Applicants' claimed ranges. As discussed above, prior to the present invention, no reason existed to modify the composition of Allen by lowering its IV into Applicants' claimed range. However, even if one did lower the IV of Allen's composition into Applicants' claimed range, the resulting lower-IV cellulose ester would not necessarily have M_w , M_n , and polydispersity values within Applicants' claimed ranges.

It is well established that in order to support a rejection based on inherency, the property asserted to be inherent must necessarily be present in the prior art. (MPEP § 2112). In other words, inherency can not be established by probabilities or possibilities. (MPEP § 2112). Therefore, in order for the M_w , M_n , and polydispersity values to be inherent in a lowered-IV composition of Allen, the Examiner must provide a rationale or evidence as to why these properties would necessarily fall within Applicants' claimed ranges.

In looking at Applicants' claimed M_w ranges (1,500–10,000) versus Allen's discloses M_w ranges (30,000–100,000), Applicants submit it is very likely that lowering the IV of Allen's cellulose ester from its lowest disclosed value (0.20 dL/g) to Applicants' highest claimed value (0.15 dL/g) would not cause the M_w of Allen's composition to decrease from its lowest claimed value (30,000) to Applicants' highest claimed value (10,000). In other words, it is likely that a 25% decrease in IV would not cause a 67% decrease in M_w .

Because there is no reason the believe that lowering the IV of Allen's cellulose ester into Applicants claimed IV range would necessarily result in a composition having M_w , M_n , and polydispersity values within Applicants' claimed ranges, the Examiner can not rely on inherency to establish obviousness of the M_w , M_n , and polydispersity values.

In view of the foregoing, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claims 32-44, 47, 66-71, and 78.

V. Newly Added Claims

Applicants have added new claims 81-84 by this Amendment. Support for new claim 81 can be found, for example, in the specification at page 11, lines 6-21; claim 1; claim 14; and claim 32. Support for new claims 82-84 can be found, for example, in the specification at page 17, lines 13-15.

As discussed above, new claim 81 is a generic to all the pending claims. Further, since new claim 81 recites the same ranges for IV, M_w , M_n , and polydispersity as claim 32, Applicants submit that claim 81 is patentable over the prior art of record. Since claim 81 is generic to all pending claims, all withdrawn claims should be rejoined in the Application upon allowance of claim 81.

New claims 82, 83, and 84 depend from independent claims 1, 14, and 32, respectively. Claims 82-84 each call for an acid value of not more than 5. In contrast, Allen teaches an acid number ranging from 40 to 130. (Col. 7, ll. 45-46). Therefore, claims 82-84 are submitted to be patentable over the prior art of record.

VI. Related Applications

In the interview of November 6, 2007, Applicants' representative informed the Examiner of several pending patent applications relating to Applicants' cellulose ester technology. The Examiner asked that Applicants identify the related applications in the written response. Pursuant to the Examiner's request, the following is a list of pending patent applications related to Applicants' cellulose ester technology:

- Serial No.: 11/810,065 (filed June 4, 2007)
- Serial No.: 11/810,011 (filed June 4, 2007)
- Serial No.: 11/856,176 (filed September 17, 2007)
- Serial No.: 11/856,179 (filed September 17, 2007)

VII. Conclusion

In view of the foregoing, Applicants submit that claims 32-44, 47, 66-71, 71, and 81-84 are in condition for allowance. Further, since claim 81 is generic to all pending claims, Applicants request rejoinder of all withdrawn claims and allowance of claims 1-84.

Respectfully submitted,

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